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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
QIAN, CELINE X	
ART UNIT	**PAPER NUMBER**
1636	

DATE MAILED: 12/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/909,544	LUE ET AL.	
	Examiner	Art Unit	
	Celine X Qian	1636	

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *23-33* is/are pending in the application.

4a) Of the above claim(s) *33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *23-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *8,13* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claims 23-33 are pending in the application.

Election/Restrictions

Applicant's election with traverse of Group XIII in Paper No. 12 is acknowledged. The traversal is on the ground(s) that the election of Group XIII should extend to Groups I, XXI, XXV and XXXIII because these groups are identically classified. This is not found persuasive because the inventions are patentably distinct for reasons set forth of the record mailed on 9/20/02. Although they are classified in the same class, this class comprises many patentably distinct subject matters. A search of one group is not co-extensive with the search of another. Therefore, a search of Groups I, XIII, XXI, XXV and XXXIII in a single application is burdensome.

The requirement is still deemed proper and is therefore made FINAL.

Applicants submitted new claims 22-33 to replace now cancelled claims 1-5, 9, 11-15 and 21. However, claim 33 is patentably distinct from the invention of Group XIII (1-5, 9, 11-15 and 21). Accordingly, claim 33 is withdrawn from consideration for being directed to non-elected subject matter. Claims 22-32 are currently under examination on merits.

Drawings

The drawings are objected to because of the informalities as indicated by Draftsperson on PTO form 948 (see attached form). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to

the drawings will not be held in abeyance. Any response to this office action which does not response to the above objections will be considered non-responsive.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 23-32 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The written description requirement is set forth by 35 U.S.C. 112, first paragraph which states that the: "*specification* shall contain a written description of the invention. . .[emphasis added]." The written description requirement has been well established and characterized in the case law. A specification must convey to one of skill in the art that "as of the filing date sought, [the inventor] was in possession of the invention." See *Vas Cath v. Mahurkar* 935 F.2d 1555, 1560 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). Applicant may show that he is in "possession" of the invention claimed by describing the invention with all of its claimed limitations "by such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention." See *Lockwood v. American Airlines Inc.* 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997).

In analyzing whether the written description requirement is met, it is first determined whether the whether a representative number of species have been described by their complete

structure. Then, it is determined whether a representative number of species have been sufficiently described by other relevant identifying characteristics. The claims recite "brain-derived neurotrophic factor (BDNF) or a functional derivative or fragment thereof." The specification only discloses administering BDNF to rats reversed erectile dysfunction caused by nerve freezing. The specification fails to describe any other "functional derivatives" or fragments of the BDNF that have the same function as BDNF. As such, it is unclear what is a functional derivative of BDNF, and which part or how big is the fragment of the BDNF has to be to have the same function as BDNF. Thus, the structural-function relationship of the "derivative" or "fragment" of BDNF is unknown. Therefore, the specification fails to describe the invention in such a way as to reasonably convey to one skilled in the art that the inventors had possession of the claimed invention at the time the application was filed.

Claims 23-32 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of treating male erectile dysfunction induced by cavernous nerve damage by administering BDNF to the patient, does not reasonably provide enablement for a method of preventing or treating male erectile dysfunction because of other factors by administering BDNF. The specification also fails to provide enablement for treating or preventing female sexual arousal disorder by administering BDNF. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make/use the invention commensurate in scope with these claims.

There are many factors to be considered when determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement and whether any necessary experimentation is "undue." These factors include, but are not

limited to: (a) the breadth of the claims; (b) the nature of the invention; (c) the state of the prior art; (d) the relative skill of those in the art; (e) the level of predictability in the art; (f) the amount of direction provided by the inventor; (g) the existence of working examples; and (h) whether the quantity of experimentation needed to make or use the invention based on the content of the disclosure is "undue" (MPEP 2164.01 (a)).

The nature of the invention is a method of treating or preventing either male erectile dysfunction or female arousal disorder by administering BDNF to the patient. The specification discloses that administering AAV vectors comprising nucleic acid encoding BDNF to male rat restored intra-cavernous pressure partially after cavernous nerve freezing (see example 3).

The state of art at the time of filing teaches that male erectile dysfunction may be the result of either psychological or physiological factors or both. Physiological factors that can cause male erectile dysfunction include hormonal insufficiency, nerve dysfunction, arterial insufficiency or venous leakage. Each of these factors alone or in combination may contribute to the erectile dysfunction. The female arousal disorder is also a multi-causal and multi-dimensional medical problem. This disorder is defined as the persistent or recurring inability to attain, or maintain adequate sexual excitement causing personal distress. The conditions can either be the result of psychological factors or physiological conditions including diminished vaginal/clitoral blood flow, altered hormonal milieu, prior pelvic trauma and use of medications such as serotonin re-uptake inhibitors (Goldstein, 2000, International Journal of Impotence Research, 12, supp. 4, S152-S157). Goldstein further discuss the physiology and molecular mechanism female arousal process which involves cGMP signaling pathway and NO, NPY and PDE appear to be important factors involved in this process. However, the prior art appears to

be silent on whether BDNF is effective in prevent or treating male erectile disorder or female arousal disorder.

The breadth of the claims is very broad. The broadest claim encompasses a method for preventing and treating erectile dysfunction caused by any factor (include both psychological or physiological) by administering BDNF. The claim also encompasses a method for preventing and treating female arousal dysfunction caused by any factor by administering BDNF.

The teaching of the specification is limited. The specification only provides a rat model for treating male erectile dysfunction caused by damaging cavernous nerve by intra-cavernous injection of nucleic acid encoding BDNF. The specification does not teach whether BDNF prevent male erectile dysfunction as a result of cavernous nerve damage. The specification also fails to teach whether BDNF can prevent or treat erectile dysfunction caused by other factors such as arterial insufficiency or venous leakage. Moreover, the specification fails to teach whether administering BDNF to female patients with sexual arousal disorder can provide treatment to those patients. Further, the specification also fails to teach whether administering BDNF to normal female would prevent future occurrence of sexual arousal disorder.

Given the complexity of the cause and molecular mechanism of both the erectile dysfunction and female sexual arousal disorder, it is unlikely that one factor is responsible for all kinds of erectile dysfunction disorder or arousal disorder. Therefore, targeting only one of the factor is not going to be an effective treatment to such disorders induced by a different factor. Based on the data provided in the specification, whether administering BDNF to an individual can prevent said disorder is also unpredictable because the specification fails to show whether administering BDNF to normal rats would prevent said disorder induced by cavernous nerve

damage. Therefore, one skilled in the art would have to engage in undue experimentation to practice the method commensurate in scope with the claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 23-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 23-32 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: How to determine the male erectile dysfunction or female sexual arousal disorder is prevented or treated.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 23, 25, 27 and 31 rejected under 35 U.S.C. 102(a) as being anticipated by Bakircioglu et al. (2000, Journal of Urology, Vol. 163, No. 4 Suppl., pp. 198).

The claims are drawn to a method of treating male erectile dysfunction by administering BDNF to a mammal. The claims are further drawn to said method wherein the erectile

dysfunction is caused by nerve dysfunction and BDNF is administered by intra-cavernous injection.

Bakircioglu et al. disclose that administering AAV-BDNF to rat underwent cavernous nerve freezing significantly increased intra-cavernous pressure compare to control rats (see page 198, 2nd col., 880, result section). Bakircioglu further discloses that intra-cavernous injection of AAV-BDNF can prevent degeneration of nNOS-containing neurons in the major pelvic ganglia and facilitate the regeneration of nNOS-containing nerve fibers in the penile tissue. Therefore, Bakircioglu et al. disclose the instantly claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Celine X Qian whose telephone number is 703-306-0283. The examiner can normally be reached on 9:00-5:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Remy Yucel can be reached on 703-305-1998. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Anne-marie Falk

ANNE-MARIE BAKER
PATENT EXAMINER

Celine Qian, Ph.D.
December 13, 2002

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.